

-38-

**WHAT IS CLAIMED IS:**

1. A method for enhancing or suppressing at least the humoral immune response or CD4 ThI immune response to a target antigen comprising administering the following:

- 5 (i) a conjugate comprising a selected antigen, which is directly or indirectly attached to an antibody that specifically binds to a molecule which is expressed by an antigen-presenting cell (APC); and
- (ii) an anti-CD40 antibody, wherein the antigen-antibody conjugate of (i) and the anti-CD40 antibody of (ii) are administered simultaneously or
- 10 substantially contemporaneously.

2. The method of claim 1 wherein the antibody attached to said antigen is selected from the group consisting of an anti-MHC class II antibody, an anti-MHC class I antibody, an anti-CD11c antibody, an anti-dendritic cell antigen antibody, an anti-follicular cell antigen antibody, and an anti-Fc molecule

15 antibody.

3. The method of Claim 1, wherein said antibody specifically binds a human class II MHC molecule or CD11c.

4. The method of Claim 1, which is effected *in vitro* by contacting antigen-presenting cells to said conjugate (i) and anti-CD40 antibody (ii).

20 5. The method of Claim 1, which is effected *in vivo*.

6. The method of Claim 5, wherein said method is effected in an aged or immuno-compromised individual.

7. The method of Claim 6, wherein the treated individual is a human subject fifty years or older.

25 8. The method of Claim 6, which is used for the treatment of viral infection, bacterial infection or cancer.

F09220"84002260

-39-

9. The method of Claim 1, wherein said antigen is expressed by a moiety selected from the group consisting of a tumor or cancer cell, a virus, a pathogen, a bacterium, a fungi, and a toxin.

10. The method according to Claim 9, wherein said cancer or tumor cell is selected from the group consisting of prostate, breast, ovarian, lung, head and neck, uterine, and leukemia.

11. The method according to Claim 9, wherein said virus is selected from the group consisting of a papillomavirus, RSV, herpes virus, influenza virus, a hepatitis virus, a polio virus, and HIV virus.

12. The method according to Claim 1, wherein the antigen-antibody conjugate of (i) and the anti-CD40 antibody are administered together.

13. The method according to Claim 1, wherein the antigen is directly attached to said antibody.

14. The method according to Claim 13, wherein said direct attachment comprises covalent attachment of the antigen and the antibody.

15. The method according to Claim 1, wherein the administered antigen-antibody conjugate of (i) and the anti-CD40 antibody are contained in the same composition.

16. The method of Claim 1 which is used to induce a protective Th1 cell-mediated immune response against a bacterial disease or protozoan disease.

17. The method of Claim 1 which is used to treat leishmanin????, Listerine?????, leprosy, or tuberculosis infection.

18. A composition adopted for enhancing or suppressing an immune response to a selected antigen which comprises at least the following:

(i) a selected antigen which is directly or indirectly attached to an antibody that specifically binds to an antigen expressed by an antigen-presenting

09720078.07504

-40-

cell (APC) selected from the group consisting of dendritic cells, B-cells, macrophages and follicular dendritic cells; and

(ii) an anti-CD40 antibody, wherein the antigen-antibody conjugate of (i) and the anti-CD40 antibody of (ii) are contained in amounts effective to enhance the humoral immune response to the antigen, relative to the antibody production obtained when said same antigen is administered at the same amounts, in the absence of the anti-CD40 antibody, and in unconjugated form.

19. The composition according to Claim 18, wherein the antibody attached to said antigen is selected from the group consisting of an anti-MHC class II antibody, an anti-MHC class I antibody, an anti-B7 antibody, an anti-dendritic cell antigen antibody, an anti-follicular cell antigen antibody, and an anti-Fc molecule antibody.

20. The composition according to Claim 19, wherein said antibody is an anti-MHC class II antibody.

21. The composition according to Claim 19, wherein said antigen is expressed by a moiety selected from the group consisting of a tumor or cancer cell, a virus, a pathogen, a bacterium and a fungus.

22. The composition according to Claim 19, wherein said virus is selected from the group consisting of a papillomavirus, a herpes virus, an influenza virus RSV, a hepatitis virus, a polio virus, and an HIV virus.

23. The composition according to Claim 18, wherein said tumor or cancer cell is selected from the group consisting of prostate, breast, ovarian, lung, head and neck, uterine, leukemia, skin, bladder, or melanoma.

24. The composition according to Claim 18, which further comprises an adjuvant.

-41-

25. The composition according to Claim 24, wherein said adjuvant is selected from the group consisting of Alum, saponin, and Freund's complete adjuvant.

26. The composition according to Claim 18, wherein said anti-CD40 antibody is selected from the group consisting of a humanized antibody, a chimeric antibody, a human monoclonal antibody, or a fragment thereof that specifically binds CD40.

27. The composition according to Claim 18, wherein said antibody that specifically binds to an antigen expressed by an antigen presenting cell (APC) is selected from the group consisting of a human monoclonal antibody, a chimeric antibody, a humanized monoclonal antibody, and a fragment thereof that specifically binds to said antigen expressed by an antigen presenting cell.

28. The composition of Claim 18, which affects at least one of CD4, Th1 activation, IL12, and  $\gamma$  interferon expression.

29. A kit adopted for enhancing at least the humoral immune response or to a particular DTH type T-cell response antigen upon administration to a host in need of such treatment which comprises at least the following:

(i) a selected antigen which is directly or indirectly attached to an antibody that specifically binds to an antigen expressed by an antigen-presenting cell (APC); and

(ii) an anti-CD40 antibody, wherein such moieties may be packaged separately or in combination.

30. The kit according to Claim 27???, which further comprises at least one additional moiety selected from the group consisting of a stabilizer, an adjuvant, a surfactant, a fungicidal agent, a bactericidal agent, a pharmaceutically acceptable carrier or excipient, and an immunostimulating peptide.

09720078-07501

09/ 720,078

-42-

31. A method for enhancing the humoral or DTH Th1 type immune response to a target antigen in an individual that is immuno-compromised because of age, disease, or genetic defect, comprising administering to said subject (i) a conjugate comprising said target antigen attached directly or indirectly to an antibody specific to an anti-MHC class II molecule, and (ii) optionally an antibody specific to CD40.
- 5

09/20078-072501